CHAIRMAN Resource

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Sent: Monday, November 17, 2014 10:46 PM
To: CHAIRMAN Resource
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Subject: November 17, 2014 Comments on National Academy of Science Fukushima Lessons Learned Report

Good morning,

First, let me correct a mistake I made. In my last e-mail, I stated that crews in the simulator in 1980 would be training on symptom-based Emergency Operating Procedures. This is wrong. I am sure that we trained on event-based EOPs in 1980. I apologize for the mistake. (Also, I am not in that picture.)

Unanticipated Information

There are a number of statements that I want to note.

The Adequate Staffing Level Is _____

You can't get past page 6 of the NAS Fukushima report without reading: "Staffing levels at the plant were inadequate.." Then, if you go to page 108, you will read that: "Just before the earthquake occurred, there were about 6,400 personnel, including 750 employees of the plant owner-operator (TEPCO), onsite." Note that a Tokyo Electric Power Company reference of "Fukushima Nuclear Accident report p. 163 is given. (Also, see NAS report, page 150).

Considering that only 3 of the (Fukushima Daiichi) nuclear units were running, that would provide about 2000 people per operating unit. How many more would it take (per unit) at Fukushima Daiichi just to be adequate in staffing? How many did it take at Fukushima Daini? (They seemed to have enough, and all 4 of their reactors had been running. Ref. NAS report, page 89).

Or, maybe it is not the number of people, but something else that is most important?

Height of High Water Protection

I guess if I had thought about it, ground subsidence after an earthquake should come as no surprise. We see on page 77 of the NAS report that: "The downward displacement of the coast, which was caused by the relaxation of elastic strain at the tectonic plate margin, lowered seawall elevations relative to mean sea level, reducing tsunami protection for coastal communities."

The time it takes for this settlement to occur is not provided. If it happens all at once, it would lower the seawall before tsunami waves arrive from that same earthquake. (The designed height would have to be raised to account for this.)

Fuel for Diesel Generators

It is a common practice to provide a fuel oil tank large enough for one shift's worth of fuel for each diesel generator, very close to the diesel. That way, with the tank filled at shift turnover time, you should have enough fuel until you get relieved. Actually, such tanks are called "day tanks."

I found a very interesting "if" in a sentence on page 54 of the NAS report: "There is enough fuel onsite to last for several days IF power and operable pumps are available to move it from large onsite storage tanks to smaller tanks that supply the diesel generators."

Were these fuel oil transfer pump motors ruined by tsunami waves? (We are not told.)

Cold Shutdown of Cold Shutdown Condition?

The Fukushima Daiichi Unit 1, Unit 2, and Unit 3 reactors do not meet the requirements (as I recall them) to be in "Cold Shutdown" as so identified on page 101 (and other places) of the NAS report. The Tokyo Electric Power Company knows this so they invented new wording.

The wording is: Cold Shutdown Condition. What is the difference? My recollection is that Cold Shutdown requires a reactor coolant temperature of 212 deg. F. (100 deg. C.), or lower, I think there is a requirement to be at atmospheric pressure but I am not sure, AND you have to have the fuel in a "coolable geometry." (Melted fuel is NOT in a coolable geometry.)

"Cold Shutdown Condition" is met if the water temperature you measure somewhere, (not specified), in the Reactor Building is 100 deg. C. or less. Except for it being above room temperature, you really don't know if the water measured was in contact with all the melted corium because, after 3 years and 8 months, we still have no confirmed idea of where the core(s) are.

Time Comparisons

You just lost all AC power at your operating BWR, (which does not have Emergency (Isolation) Condensers). Your general course of action probably is to reduce reactor pressure then inject water with low pressure pumps such as the installed diesel fire pump. So, if you can actuate a relief valve, you can send steam to the suppression pool and reduce reactor vessel pressure,...up to a point. Then, probably, you will need to vent the suppression pool to reduce its pressure. It is of interest to see how long this takes, since you need to be able to inject low pressure water before the core starts melting. In other words, the primary containment venting has to be done in less time than the time it takes for core melting to start. Did it?

Go to Table C.1 on page 316 of the NAS report and read the line: "Estimated time of core damage" and the line: "Containment venting preparation/success."

For Unit 1, it took 24 hours for successful venting. Core damage started in 4 hours.

For Unit 2, they could NEVER vent the primary containment. Core damage started in 75 hours.

For Unit 3, it took 42 hours for successful venting. Core damage started in 36 hours.

Did a TEPCO requirement to throttle a valve in the primary containment vent path help? Did similar placement of a rupture disk in series (on all three plants) help?

Note that Figure 4.2 on page 113 and Figure 4.4 on page 120 of the NAS report do not show the rupture disk. Figure 4.4 also does not show the valve to be throttled.

Following the Rules

From page 240 of the NAS report:

"TEPCO has admitted to falsifying reports to its regulator in 29 cases between 1988 and 1998 and to frauds in safety-related inspections at the Fukushima Daiichi plant in 1993-1994."

Maybe you can follow the description of events at Unit 5 on NAS report pages 130, 131, and 132. I don't understand how the pressure testing was being done at 90 deg. C. and about 1000 psi. I do understand this: "The containment in Unit 5 was open." (Ref. page 106, NAS report: "because the reactor was at elevated pressure, it was not strictly in cold shutdown.") I don't think that would follow our 1980s rules. Does it follow theirs today?

Is there any financial penalty for not following the rules? Is there any incentive for following them? If there are none, is there any reason for a regulator to expect that rules will be followed?

Thank you,

Tom Gurdziel
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